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Test 1584: Case International 3594 Powershift Diesel 12 and 24-Speeds

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NEBRASKA TRACTOR TEST 1584

CASE INTERNATIONAL 3594 POWERSHIFT DIESEL

24 SPEED ALSO 12 SPEED

Department of Agricultural Engineering

Dates of Test: October 16 to 31, 1985

Manufacturer: J.I. CASE COMPANY, 700 State Street, Racine, Wisconsin 53404

POWER TAKE-OFF PERFORMANCE

| Power H _p (kW) | Crank shaft speed rpm | Fuel Consumption | | | Temperature °F (°C) | | | Barometer inch Hg (kPa) | |
|---|--------------------------------|--------------------|-----------------------|-----------------------|---------------------|--------------------|--------------------|-------------------------------|------------------|
| | | gal/hr (l/h) | lb/hp.hr (kg/kW.h) | Hp.hr/gal (kW.h/l) | Cooling medium | Air wet bulb | Air dry bulb | | |
| MAXIMUM POWER AND FUEL CONSUMPTION | | | | | | | | | |
| Rated Engine Speed — Two hours (PTO Speed — 1002 rpm) | | | | | | | | | |
| 182.27 (135.92) | 2100 | 11.800 (44.667) | 0.454 (0.276) | 15.45 (3.043) | 196 (90.8) | 60 (15.4) | 75 (24.1) | 28.75 (97.07) | |
| VARYING POWER AND FUEL CONSUMPTION — Two Hours | | | | | | | | | |
| 160.42 (119.62) | 2174 | 10.602 (40.132) | 0.463 (0.282) | 15.13 (2.981) | 187 (86.1) | 57 (13.9) | 75 (23.6) | | |
| 0.00 (0.00) | 2294 | 2.982 (11.288) | | | 176 (80.0) | 56 (13.3) | 71 (21.7) | | |
| 83.01 (61.90) | 2254 | 6.572 (24.876) | 0.555 (0.338) | 12.63 (2.488) | 180 (81.9) | 57 (13.6) | 79 (25.8) | | |
| 182.79 (136.31) | 2100 | 11.808 (44.699) | 0.453 (0.276) | 15.48 (3.049) | 191 (88.1) | 56 (13.3) | 76 (24.4) | | |
| 41.86 (31.22) | 2272 | 4.728 (17.896) | 0.792 (0.482) | 8.86 (1.744) | 183 (83.6) | 55 (12.8) | 75 (23.9) | | |
| 122.86 (91.61) | 2221 | 8.595 (32.537) | 0.491 (0.298) | 14.29 (2.816) | 183 (83.9) | 55 (12.8) | 76 (24.2) | | |
| Av Av | 98.49 (73.45) | 2219 | 7.548 (28.571) | 0.537 (0.327) | 13.05 (2.571) | 183 (83.9) | 56 (13.3) | 75 (23.9) | 28.73 (97.02) |

DRAWBAR PERFORMANCE

| Power Hp (kW) | Drawbar pull lbs (kN) | Speed mph (km/h) | Crank- shaft speed rpm | Slip % | Fuel Consumption | | | Temp. °F (°C) | | | |
|---|--------------------------------|------------------------|---------------------------------|-----------|--------------------|-----------------------|-----------------------|---------------------|--------------------|--------------------|----------------------------|
| | | | | | gal/hr (l/h) | lb/hp.hr (kg/kW.h) | Hp.hr/gal (kW.h/l) | Cool- ing med | Air wet bulb | Air dry bulb | Barom. inch Hg (kPa) |
| Maximum Available Power — Two Hours 16th (3-4) Gear | | | | | | | | | | | |
| 160.39 (119.60) | 8668 (38.55) | 6.94 (11.17) | 2100 | 2.19 | 11.708 (44.321) | 0.512 (0.311) | 13.70 (2.699) | 190 (87.5) | 53 (11.7) | 61 (16.1) | 29.05 (98.08) |
| 75% of Pull at Maximum Power — Ten Hours 16th (3-4) Gear | | | | | | | | | | | |
| 129.20 (96.35) | 6621 (29.45) | 7.32 (11.78) | 2202 | 1.74 | 10.010 (37.892) | 0.543 (0.330) | 12.91 (2.543) | 187 (85.9) | 50 (10.0) | 62 (16.4) | 29.06 (98.14) |
| 50% of Pull at Maximum Power — Two Hours 16th (3-4) Gear | | | | | | | | | | | |
| 88.30 (65.84) | 4414 (19.63) | 7.50 (12.07) | 2248 | 1.31 | 7.886 (29.854) | 0.626 (0.381) | 11.20 (2.206) | 184 (84.4) | 47 (8.3) | 52 (11.1) | 29.06 (98.11) |
| 50% of Pull at Reduced Engine Speed — Two Hours 18th (3-6) Gear | | | | | | | | | | | |
| 88.42 (65.93) | 4413 (19.63) | 7.51 (12.09) | 1800 | 1.26 | 6.767 (25.616) | 0.537 (0.326) | 13.07 (2.574) | 184 (84.4) | 51 (10.6) | 60 (15.3) | 29.05 (98.08) |

FUEL, OIL AND TIME: Fuel No. 2 Diesel Cetane No. 46.9 (rating taken from oil company's inspection data) Specific gravity converted to 60/60°F (15/15°C) 0.8421 Fuel weight 7.012 lbs/gal (0.840 kg/l) Oil Case Enginegard SAE 30 API service classification CD/SF To motor 5.204 gal (19.698 l) Drained from motor 4.873 gal (18.447 l) Transmission and hydraulic lubricant Case Powergard PTF transmission fluid Front axle lubricant Case Loadgard-GL5 85W140EP gear lubricant Total time engine was operated 43.5 hours.

ENGINE: Make Case Diesel Type six cylinder vertical with turbocharger Serial No. *10365398* Crankshaft lengthwise Rated rpm 2100 Bore and stroke 4.625" × 5.00" (117.5 mm × 127 mm) Compression ratio 15.8 to 1 Displacement 504 cu in (8259 ml) Starting system 12 volt Lubrication pressure Air cleaner two paper elements and aspirator Oil filter two full flow cartridges Oil cooler engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil Fuel filter two paper cartridges and prestrainer Muffler vertical Cooling medium temperature control two thermostats.

CHASSIS: Type all wheel drive with rear duals and constant mesh front axle Serial No. *9939036* Tread width rear 64" (1626 mm) to 134" (3404 mm) front 60" (1524 mm) to 89" (2261 mm) Wheel base 116" (2946 mm) Center of gravity (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 34.0" (864 mm) Vertical distance above roadway 38.0" (965 mm) Horizontal distance from center of rear wheel tread 0" (0 mm) to the right/left Hydraulic control system direct engine drive Transmission selective gear fixed ratio with partial (6) range operator controlled powershift Advertised speeds mph (km/h) first 1.9 (3.0) second 2.1 (3.4) third 2.5 (4.0) fourth 2.9 (4.6) fifth 3.1 (5.0) sixth 3.2 (5.2) seventh 3.6 (5.8) eighth 3.7 (6.0) ninth 4.3 (6.9) tenth 4.4 (7.0) eleventh 4.9 (7.9) twelfth 5.0 (8.1) thirteenth 5.4 (8.6) fourteenth 5.8 (9.4) fifteenth 6.2 (9.9) sixteenth 6.7 (10.8) seventeenth 7.3 (11.7) eighteenth 8.4 (13.5) nineteenth 10.4 (16.7) twentieth 11.9 (19.1) twenty-first 13.8 (22.2) twenty-second 15.9 (25.5) twenty-third 17.2 (27.7) twenty-fourth 20.8 (33.5) reverse 3.1 (5.0), 5.4 (8.6), 7.3 (11.7) Clutch wet multiple disc

MAXIMUM POWER IN SELECTED GEARS

| | | | | | | | | | |
|--------------------|------------------|-----------------|------|-------|-----------------|---------------|--------------|--------------|------------------|
| 145.08 (108.19) | 20384 (90.67) | 2.67 (4.30) | 2153 | 14.12 | 4th (1-4) Gear | 184 (84.2) | 37 (2.8) | 40 (4.4) | 29.08 (98.20) |
| 155.27 (115.79) | 19944 (88.71) | 2.92 (4.70) | 2099 | 11.11 | 5th (1-5) Gear | 185 (85.0) | 43 (6.1) | 46 (7.8) | 29.02 (98.00) |
| 160.80 (119.91) | 19280 (85.76) | 3.13 (5.03) | 2101 | 8.28 | 6th (2-1) Gear | 186 (85.3) | 44 (6.7) | 48 (8.9) | 29.05 (98.10) |
| 162.18 (120.94) | 16964 (75.46) | 3.59 (5.77) | 2102 | 5.50 | 7th (1-6) Gear | 189 (87.2) | 54 (12.2) | 75 (23.9) | 29.08 (98.20) |
| 163.28 (121.76) | 16463 (73.23) | 3.72 (5.99) | 2099 | 5.33 | 8th (2-2) Gear | 189 (87.2) | 54 (12.2) | 74 (23.3) | 29.08 (98.20) |
| 163.33 (121.79) | 14044 (62.47) | 4.36 (7.02) | 2100 | 4.08 | 9th (2-3) Gear | 191 (88.3) | 55 (12.8) | 73 (22.8) | 29.07 (98.17) |
| 164.37 (122.57) | 13890 (61.78) | 4.44 (7.14) | 2100 | 3.92 | 10th (3-1) Gear | 191 (88.1) | 56 (13.3) | 72 (22.2) | 29.07 (98.17) |
| 165.12 (123.13) | 12220 (54.36) | 5.07 (8.15) | 2100 | 3.32 | 11th (2-4) Gear | 190 (87.5) | 56 (13.3) | 72 (22.2) | 29.07 (98.17) |
| 164.99 (123.03) | 12008 (53.41) | 5.15 (8.29) | 2099 | 3.23 | 12th (3-2) Gear | 190 (87.8) | 56 (13.3) | 72 (22.2) | 29.07 (98.17) |
| 164.29 (122.51) | 11190 (49.78) | 5.51 (8.86) | 2098 | 2.89 | 13th (2-5) Gear | 190 (87.8) | 55 (12.8) | 72 (22.2) | 29.07 (98.17) |
| 163.41 (121.85) | 10223 (45.47) | 5.99 (9.65) | 2100 | 2.63 | 14th (3-3) Gear | 192 (88.6) | 55 (12.8) | 72 (22.2) | 29.07 (98.17) |
| 163.44 (121.88) | 9592 (42.67) | 6.39 (10.28) | 2101 | 2.37 | 15th (2-6) Gear | 191 (88.3) | 55 (12.8) | 72 (22.2) | 29.08 (98.20) |
| 163.52 (121.94) | 8828 (39.27) | 6.95 (11.18) | 2100 | 2.19 | 16th (3-4) Gear | 192 (88.6) | 56 (13.3) | 72 (22.2) | 29.09 (98.23) |
| 161.82 (120.67) | 8045 (35.78) | 7.54 (12.14) | 2100 | 2.11 | 17th (3-5) Gear | 191 (88.3) | 56 (13.3) | 72 (22.2) | 29.09 (98.23) |
| 159.35 (118.83) | 6852 (30.48) | 8.72 (14.04) | 2099 | 1.58 | 18th (3-6) Gear | 191 (88.3) | 55 (12.8) | 72 (22.2) | 29.08 (98.20) |

LUGGING ABILITY IN 16th (3-4) GEAR

| | | | | | | |
|----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|------------------|
| Crankshaft Speed rpm | 2100 | 1892 | 1672 | 1474 | 1257 | 1059 |
| Pull—lbs (kN) | 8828 (39.27) | 9793 (43.56) | 10432 (46.40) | 10630 (47.28) | 10235 (45.53) | 9210 (40.97) |
| Increase in Pull % | 0 | 11 | 18 | 20 | 16 | 4 |
| Power—Hp (kW) | 163.52 (121.94) | 162.93 (121.50) | 153.05 (114.13) | 137.45 (102.49) | 112.96 (84.23) | 85.84 (64.01) |
| Speed—Mph (km/h) | 6.95 (11.18) | 6.24 (10.04) | 5.50 (8.85) | 4.85 (7.80) | 4.14 (6.66) | 3.49 (5.62) |
| Slip % | 2.19 | 2.54 | 2.54 | 2.89 | 2.72 | 2.54 |

TRACTOR SOUND LEVEL WITH CAB

dB(A)

| | |
|---|------|
| Maximum Available Power—Two Hours | 77.0 |
| 75% of Pull at Maximum Power—Ten Hours | 76.0 |
| 50% of Pull at Maximum Power—Two Hours | 76.5 |
| 50% of Pull at Reduced Engine Speed—Two Hours | 74.5 |
| Bystander in 23rd (4-5) gear | 88.5 |

TIRES, BALLAST AND WEIGHT

| Rear Tires | | With Ballast | Without Ballast |
|----------------------------------|---------------------------------------|---|---|
| —No., size, ply & psi (kPa) | | Four 20.8R38; 8; inner 16 (110) outer 12 (85) | Four 20.8R38; 8; inner 16 (110) outer 12 (85) |
| Ballast | —Liquid (each) —Test equip. (each) | None 8 lb (3 kg) | None None |
| Front Tires | | With Ballast | Without Ballast |
| —No., size, ply & psi (kPa) | | Two 16.9-28; 10; 28 (195) | Two 16.9-28; 10; 28 (195) |
| Ballast | —Liquid (each) —Cast Iron (each) | 688 lb (312 kg) 752 lb (341 kg) | None None |
| Height of Drawbar | | 23 in (585 mm) | 23 in (585 mm) |
| Static Weight with Operator—Rear | | 12520 lb (5679 kg) | 12490 lb (5666 kg) |
| —Front | | 7980 lb (3620 kg) | 5100 lb (2313 kg) |
| —Total | | 20500 lb (9299 kg) | 17590 lb (7979 kg) |

hydraulically power actuated by foot pedal **Brakes** wet multiple disc hydraulically power actuated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 173" (4.39 m) left 173" (4.39 m)(on concrete surface without brake) right 233" (5.92 m) left 233" (5.92 m) **Turning space diameter** (on concrete surface with brake applied) right 364" (9.25 m) left 364" (9.25 m)(on concrete surface without brake) right 486" (12.34 m) left 486" (12.34 m) **Power take-off** 1002 rpm at 2100 engine rpm **Unladen tractor mass** 15620 lb (7085 kg).

REPAIRS AND ADJUSTMENTS: During preliminary PTO test, the PTO control cable broke. The cable was replaced at end of tests.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 162°F (72.2°C). Fifteen gears were chosen between 15% slip and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1584**, December 3, 1985.

LOUIS I. LEVITICUS

Engineer-in-Charge

K. VON BARGEN

W. E. SPLINTER

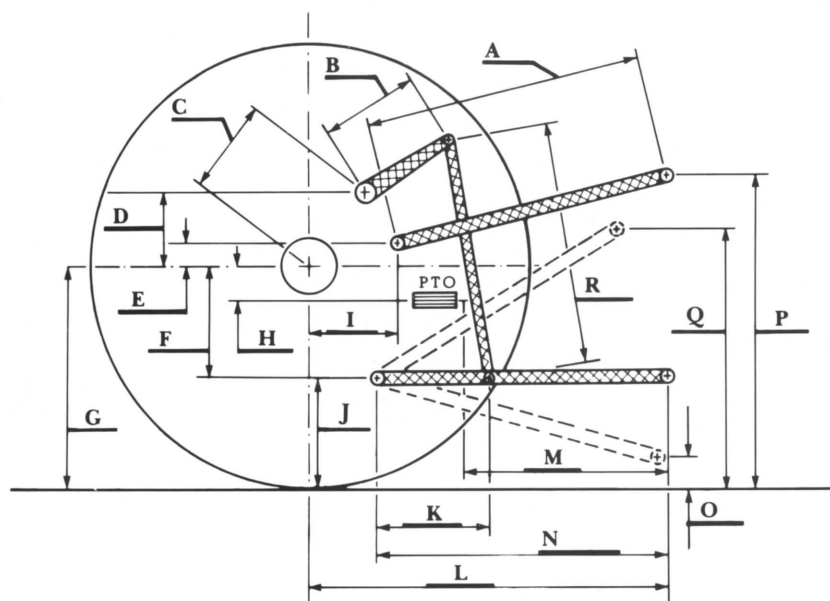
L. L. BASHFORD

Board of Tractor Test Engineers

THREE POINT HITCH PERFORMANCE

| | | |
|-------------------------------------|-------------------------|-----------------------------|
| Observed Maximum Pressure psi (kPa) | 2250 (15510) | |
| Location | remote outlet | |
| Hydraulic oil temperature °F (°C) | 157 (69) | |
| Location | transmission drain plug | |
| | Maximum Lift Capacity | Lift Capacity for Transport |
| QUICK ATTACH | yes | |
| CATEGORY | III | *not measured |
| LOAD lbs (kg) | 7758 (3519) | |
| TIME sec | 1.93 | |
| HITCH POINT MOVEMENT in (mm) | | |
| Lowest position | 9.9 (251) | |
| Top of timed range | 35.9 (912) | |
| Highest position | 40.2 (1021) | |
| LOAD CG MOVEMENT in (mm) | | |
| Lowest position | 10.0 (254) | |
| Top of timed range | 39.3 (998) | |
| Highest position | 46.0 (1168) | |

*Implement load capacity for transport purposes not specified by manufacturer.



Hitch Dimensions as Tested — No Load

| | inch | mm |
|----|------|------|
| A | 23.5 | 597 |
| B | 11.4 | 289 |
| C | 11.5 | 293 |
| D | 1.9 | 48 |
| E | 7.7 | 196 |
| F | 12.7 | 322 |
| G | 33.9 | 862 |
| H | 6.0 | 152 |
| I | 21.9 | 557 |
| J | 21.3 | 540 |
| K | 17.4 | 441 |
| L | 45.8 | 1163 |
| L' | 49.8 | 1265 |
| M | 21.1 | 536 |
| N | 35.4 | 899 |
| O | 8.0 | 203 |
| P | 43.4 | 1101 |
| Q | 40.6 | 1032 |
| R | 21.9 | 556 |

L' to end of quick attach



Case International 3594 Diesel